

CLAIM

1. A transmitter comprising:

modulated signal generating means for generating a modulated signal,

phase/amplitude separating means for separating said modulated signal generated by said modulated signal generating means into a phase component and an amplitude component,

amplitude slicing means for slicing said amplitude component separated by said phase/amplitude separating means at a plurality of voltage levels being different stepwise,

a plurality of switching regulators for converting the power supply voltage into a plurality of voltages having different values stepwise,

a switch group for selecting one of the output voltages of said plurality of switching regulators,

a switch driver for selectively conducting each switch of said switch group according to the slice data of the amplitude component sliced by said amplitude slicing means,

linear voltage converting means for voltage-converting said amplitude component by using the output voltage of one of the switching regulators selected by said

switch group as the power supply voltage, and

a high-frequency power amplifier for receiving said phase component at the high-frequency input terminal thereof, for receiving the amplitude component voltage-converted by said linear voltage converting means at the power supply terminal thereof and for, as a result, outputting a modulated wave in which amplitude and phase are multiplied.

2. A transmitter comprising:

modulated signal generating means for generating a modulated signal,

phase/amplitude separating means for separating said modulated signal generated by said modulated signal generating means into a phase component and an amplitude component,

amplitude slicing means for slicing said amplitude component separated by said phase/amplitude separating means at a plurality of voltage levels being different stepwise,

a plurality of switching regulators for converting the power supply voltage into a plurality of voltages having different values stepwise,

a plurality of linear voltage converting means for voltage-converting said amplitude component by using each

of the output voltages of the plurality of switching regulators as the power supply voltage,

a switch group for transmitting said amplitude component to said plurality of linear voltage converting means,

a switch driver for selectively conducting each switch of said switch group according to the slice data of the amplitude component sliced by said amplitude slicing means, and

a high-frequency power amplifier for receiving said phase component at the high-frequency input terminal thereof, for receiving the amplitude component voltage-converted by said plurality of linear voltage converting means at the power supply terminal thereof and for, as a result, outputting a modulated wave in which amplitude and phase are multiplied.

3. A transmitter in accordance with claim 1 or 2, wherein frequency converting means is provided between the phase component output terminal of said phase/amplitude separating means and the input terminal of said high-frequency power amplifier.

4. A transmitter in accordance with claim 1 or 2, further comprising:

feedback means, provided at the output terminal of said high-frequency power amplifier, for feeding back the high-frequency output power,

first timing correcting means for generating a first correction signal for correcting the timing deviation of phase and amplitude on the basis of the signal of said feedback means, and

first timing amending means for receiving said first correction signal from said first timing correcting means and for amending the timing of said amplitude component and said phase component output from said phase/amplitude separating means.

5. A transmitter in accordance with claim 1 or 2, further comprising:

first voltage detecting means, provided between the output terminal of said switching regulator and the power supply voltage input terminal of said linear voltage converting means, for detecting the output voltage of said switching regulator,

second voltage detecting means, provided at the amplitude component input terminal of said linear voltage converting means, for detecting the voltage of said amplitude component,

second timing correcting means for outputting a

second correction signal for correcting the timing deviation of said amplitude component and said slice data by comparing the voltage amplitude data obtained from said first and second voltage detecting means, and

second timing amending means for receiving said second correction signal from said second timing correcting means and for amending the timing of said amplitude component and said slice data.

6. A transmitter in accordance with claim 1 or 2, wherein said linear voltage converting means is an emitter follower.

7. A transmitter in accordance with claim 1 or 2, wherein said linear voltage converting means is a linear regulator.

8. A transmitter in accordance with claim 6, wherein said amplitude component is input to an operational amplifier, the output of said operational amplifier is connected to the input of said emitter follower, and the output of said emitter follower is fed back negatively to said operational amplifier.

9. A transmitter in accordance with claim 6, wherein

said emitter follower is formed of a push-pull circuit, said amplitude component is input to an operational amplifier, the output of said operational amplifier is connected to the input of said push-pull circuit, and the output of said push-pull circuit is fed back negatively to said operational amplifier.

10. A transmitter comprising:

modulated signal generating means for generating a modulated signal,

amplitude extracting means for extracting an amplitude component from said modulated signal generated by said modulated signal generating means,

amplitude slicing means for slicing said amplitude component extracted by said amplitude extracting means at a plurality of voltage levels being different stepwise,

a plurality of switching regulators for converting the power supply voltage into a plurality of voltages having different values stepwise,

a switch group for selecting one of the output voltages of said plurality of switching regulators,

a switch driver for selectively conducting each switch of said switch group according to the slice data of the amplitude component sliced by said amplitude slicing means,

linear voltage converting means for voltage-converting said amplitude component by using the output voltage of one of said switching regulators selected by said switch group as the power supply voltage, and

a high-frequency power amplifier for receiving said modulated signal at the high-frequency input terminal thereof, for receiving the amplitude component voltage-converted by said linear voltage converting means at the power supply terminal thereof and for, as a result, outputting a modulated wave.

11. A transmitter comprising:

modulated signal generating means for generating a modulated signal,

amplitude extracting means for extracting an amplitude component from said modulated signal generated by said modulated signal generating means,

amplitude slicing means for slicing said amplitude component extracted by said amplitude extracting means at a plurality of voltage levels being different stepwise,

a plurality of switching regulators for converting the power supply voltage into a plurality of voltages having different values stepwise,

a plurality of linear voltage converting means for voltage-converting said amplitude component by using each

of the output voltages of said plurality of switching regulators as the power supply voltage,

a switch group for transmitting said amplitude signal to said plurality of linear voltage converting means,

a switch driver for selectively conducting each switch of said switch group according to the slice data of the amplitude component sliced by said amplitude slicing means, and

a high-frequency power amplifier for receiving said modulated signal at the high-frequency input terminal thereof, for receiving the amplitude component voltage-converted by said plurality of linear voltage converting means at the power supply terminal thereof and for, as a result, outputting a modulated wave.

12. A transmitter in accordance with claim 10 or 11, wherein said linear voltage converting means is an emitter follower.

13. A transmitter in accordance with claim 10 or 11, wherein said linear voltage converting means is a linear regulator.

14. A transmitter in accordance with claim 12, wherein said amplitude component is input to an operational

amplifier, the output of said operational amplifier is connected to the input of said emitter follower, and the output of said emitter follower is fed back negatively to said operational amplifier.

15. A transmitter in accordance with claim 12, wherein said emitter follower is formed of a push-pull circuit, said amplitude component is input to an operational amplifier, the output of said operational amplifier is connected to the input of said push-pull circuit, and the output of said push-pull circuit is fed back negatively to said operational amplifier.